

# SAFETY DATA SHEET

## 1. SUBSTANCE AND SOURCE IDENTIFICATION

### Product Identifier

**SRM Number:** 2723b  
**SRM Name:** Sulfur in Diesel Fuel Oil (Nominal Mass Fraction 10 mg/kg)  
**Other Means of Identification:** Not Applicable.

### Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended for the evaluation of methods and the calibration of instruments used in the determination of total sulfur in fuel oils or materials of similar matrix. SRM 2723b is a commercial "No. 2-D" distillate fuel oil as defined by ASTM D 975-11 *Standard Specification for Diesel Fuel Oils* [1]. A unit of SRM 2723b consists of a 100 mL bottle of diesel fuel oil.

### Company Information

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## 2. HAZARDS IDENTIFICATION

### Classification

<b>Physical Hazard:</b> Combustible liquid	Category 4
<b>Health Hazard:</b> Aspiration hazard	Category 1
Carcinogenicity	Category 2

### Label Elements

#### Symbol



#### Signal Word

DANGER

#### Hazard Statement(s)

H227 Combustible liquid.  
 H304 May be fatal if swallowed and enters airways.  
 H351 Suspected of causing cancer.

#### Precautionary Statement(s):

P201 Obtain special instructions before use.  
 P210 Keep away from heat, sparks, open flames, and hot surfaces. – No smoking.  
 P280 Wear protective gloves, protective clothing, and eye protection.  
 P301 + P310 If swallowed: Immediately call a doctor.  
 P308 + P313 If exposed or concerned: Get medical attention.  
 P331 Do not induce vomiting.  
 P403 + P235 Store in a well-ventilated place. Keep cool.  
 P405 Store locked up.  
 P501 Dispose of contents and container according to local regulations.

**Hazards Not Otherwise Classified:** Not applicable.

**Ingredients(s) with Unknown Acute Toxicity:** Not applicable.

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### 3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

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**Substance:** Diesel Fuel Oil No. 2-D

**Other Designations:** Diesel oil; home heating oil; No. 2 fuel oil.

Components are listed in compliance with OSHA 29 CFR 1910.1200; for the actual values see the Certificate of Analysis.

Hazardous Components	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Diesel Fuel Oil No. 2-D	68476-30-2	270-671-4	100

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### 4. FIRST AID MEASURES

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**Description of First Aid Measures:**

**Inhalation:** If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

**Skin Contact:** Wash exposed skin with soap and water for at least 15 minutes. Seek medical attention if needed.

**Eye Contact:** Immediately flush eyes, including under the eyelids with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

**Ingestion:** Aspiration hazard. Do not induce vomiting. If vomiting occurs, keep head lower than hips to prevent aspiration. If not breathing, give artificial respiration by qualified personnel. Seek immediate medical attention.

**Most Important Symptoms/Effects, Acute and Delayed:** Irritation, dizziness, nausea, coughing, and aspiration.

**Indication of any immediate medical attention and special treatment needed, if necessary:** Not applicable.

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### 5. FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** Moderate fire hazard. Vapor is heavier than air and may ignite at a distant source and flash back. Vapor/air mixtures are explosive above the flash point. See Section 9, "Physical and Chemical Properties" for flammability properties.

**Extinguishing Media:**

Suitable: Regular dry chemical, carbon dioxide, regular foam, and water spray.

Unsuitable: Avoid using straight water streams in order to avoid frothing.

**Specific Hazards Arising from the Chemical:** Combustible liquid.

**Special Protective Equipment and Precautions for Fire-Fighters:** Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

**NFPA Ratings** (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1

Fire = 2

Reactivity = 0

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### 6. ACCIDENTAL RELEASE MEASURES

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**Personal Precautions, Protective Equipment and Emergency Procedures:** Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

**Methods and Materials for Containment and Clean up:** Absorb spilled material with sand or non-combustible material and collect in appropriate container for disposal.

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### 7. HANDLING AND STORAGE

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**Safe Handling Precautions:** See Section 8, "Exposure Controls and Personal Protection".

**Storage:** Store and handle in accordance with all current regulations and standards. Store in a well-ventilated area under normal laboratory conditions, and away from direct sunlight.

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## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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### Exposure Limits:

NIOSH (REL):	No exposure limits established.
ACGIH (TLV):	100 mg/m <sup>3</sup> TWA (as total hydrocarbons, inhalable fraction and vapor). Skin – potential significant contribution to overall exposure by the cutaneous route.
OSHA (PEL):	No exposure limits established.

**Engineering Controls:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**Personal Protection Measures:** In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

**Respiratory Protection:** If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

**Eye/Face Protection:** Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

**Skin and Body Protection:** Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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### Diesel Fuel Oil No. 2-D

#### Descriptive Properties:

<b>Appearance (physical state, color, etc.):</b>	Colorless liquid
<b>Molecular Formula:</b>	Not applicable
<b>Molar Mass (g/mol):</b>	Not applicable
<b>Odor:</b>	Petroleum odor
<b>Odor threshold:</b>	0.11 ppm
<b>pH:</b>	Not available
<b>Evaporation rate:</b>	Not available
<b>Melting point/freezing point:</b>	–18 °C (–0.4 °F)
<b>Relative Density:</b>	0.87 – 0.90 g/cm <sup>3</sup>
<b>Vapor Pressure:</b>	2.6 mmHg 20°C
<b>Vapor Density:</b>	>1
<b>Viscosity (@ 40 °C):</b>	2.7576 × 10 <sup>–6</sup> m <sup>2</sup> /s
<b>Solubility(ies):</b>	Insoluble in water
<b>Partition coefficient (n-octanol/water):</b>	Not available

#### Thermal Stability Properties:

<b>Autoignition Temperature:</b>	>246 °C (>474.8 °F)
<b>Thermal Decomposition</b>	Not available
<b>Initial boiling point and boiling range:</b>	150 °C to 370 °C (302 °F to 698 °F)
<b>Explosive Limits, LEL:</b>	0.6 %
<b>Explosive Limits, UEL:</b>	7.5 %
<b>Flash Point</b>	68.3 °C (155 °F)
<b>Flammability (solid, gas):</b>	Not applicable

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** Stable at normal temperatures and pressure.

**Stability:**   X   Stable        Unstable

**Possible Hazardous Reactions:** None listed.

**Conditions to Avoid:** Avoid heat, flames, sparks or other sources of ignition. Container may rupture or explode if exposed to heat.

**Incompatible Materials:** Oxidizers.

**Fire/Explosion Information:** See Section 5, “Fire Fighting Measures”.

**Hazardous Decomposition:** Oxides of carbon, oxides of sulfur.

**Hazardous Polymerization:** \_\_\_\_\_ Will Occur       X  Will Not Occur

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Exposure:**     X  Inhalation       X  Skin       X  Ingestion

**Symptoms Related to the Physical, Chemical and Toxicological Characteristics:** Dizziness, nausea, coughing.

**Potential Health Effects (Acute, Chronic and Delayed):**

**Inhalation:** Acute exposure to high levels of vapor may cause central nervous system depression, headache, dizziness, nausea, vomiting, anorexia, incoordination and unconsciousness. Prolonged or repeated exposure may cause irritation.

**Skin Contact:** Acute exposure may cause redness. In animal tests, fuel oils caused moderate irritation, erythema, and edema. Chronic skin exposure may cause defatting and drying of the skin resulting in irritation and dermatitis.

**Eye Contact:** Acute exposure of liquid or vapor may cause irritation. In animal tests, exposure to fuel oils caused mild irritation.

**Ingestion:** Diesel fuel may cause lung damage if aspirated into the lungs and may be fatal. Symptoms may include coughing, difficulty breathing, cyanosis and pulmonary edema. Acute exposure by ingestion may cause nausea, vomiting, cramping, and symptoms of the central nervous system depression.

**Numerical Measures of Toxicity:**

**Acute Toxicity:** Not classified.

Rat, Oral LD50: 12 g/kg

Rat, Inhalation LC50: 4.6 mg/L 4 h

Rabbit, Skin LD50: 4720 µL/kg

**Skin Corrosion/Irritation:** Not classified.

Rabbit, Skin: 500 mg/24 h, moderate.

**Serious Eye Damage/Irritation:** Not classified.

Rabbit, Eye: 100 mg/30 s, mild.

**Respiratory Sensitization:** No data available.

**Skin Sensitization:** No data available.

**Germ Cell Mutagenicity:** No data available.

**Carcinogenicity:** Category 2.

**Listed as a Carcinogen/Potential Carcinogen**      \_\_\_\_\_ Yes       X  No

NTP does not list Diesel Fuel Oil No. 2 as a carcinogen.

IARC lists diesel fuels as Group 3, *not classifiable*, as to their carcinogenicity to humans.

ACGIH lists Diesel Fuel Oil No. 2 as an A3 – confirmed animal carcinogen with unknown relevance to humans.

**Reproductive Toxicity:** Not classified.

**Specific Target Organ Toxicity, Single Exposure:** Not classified.

**Specific Target Organ Toxicity, Repeated Exposure:** Not classified.

**Aspiration Hazard:** Category 1.

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## 12. ECOLOGICAL INFORMATION

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**Ecotoxicity Data:**

Fish Toxicity: Fathead minnow (*Pimephales promelas*) LC50: 35 mg/L (flow through) 96 h.

**Persistence and Degradability:** Absorbed and immobile in soil. Microorganisms have the capacity to biodegrade.

**Bioaccumulative Potential:** Bioaccumulation may occur in aquatic organisms.

**Mobility in Soil:** No data available.

**Other Adverse effects:** No data available.

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### 13. DISPOSAL CONSIDERATIONS

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**Waste Disposal:** Dispose of waste in accordance with all applicable federal, state, and local regulations.

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### 14. TRANSPORTATION INFORMATION

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**U.S. DOT and IATA:** This material is not regulated by IATA or DOT in non-bulk packaging per 173.150(f)(2) based on flash point; see Section 9, "Physical and Chemical Properties".

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### 15. REGULATORY INFORMATION

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**U.S. Regulations:**

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH: Yes.

CHRONIC HEALTH: Yes.

FIRE: Yes.

REACTIVE: No.

PRESSURE: No.

**State Regulations:**

California Proposition 65: Not listed.

**U.S. TSCA Inventory:** Listed.

**TSCA 12(b), Export Notification:** Not listed.

**Canadian Regulations:**

WHMIS Information: Not provided for this material.

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### 16. OTHER INFORMATION

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**Issue Date:** 03 November 2015

**Sources:** ChemADVISOR, Inc., SDS, *Fuel Oil No. 2*, 22 September 2015.

National Library of Medicine, Hazardous Substances Databank, *Fuel Oil No. 2*, <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB> (accessed Nov 2015).

International Chemical Safety Cards (ICSC) *Fuels, Diesel, No. 2*, ICSC: 1561, [http://www.ilo.org/dyn/icsc/showcard.display?p\\_lang=en&p\\_card\\_id=1561](http://www.ilo.org/dyn/icsc/showcard.display?p_lang=en&p_card_id=1561) (accessed Nov 2015).

49 CFR 173.150, *U.S. Department of Transportation*, 01 October 2011.

IATA, *Dangerous Goods Regulations*, 54th ed., 01 January 2013.

**Key of Acronyms:**

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Association	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration	STEL	Short Term Exposure Limit
LD50	Median Lethal Dose or Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

**Disclaimer:** Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail [srmmsds@nist.gov](mailto:srmmsds@nist.gov); or via the Internet at <http://www.nist.gov/srm>.